Facilitating Group Work To Maximize Student Learning in Labs, Discussions, and Teams

Designing a Background Questionnaire

Cooperative groups should be carefully structured to maximize the active and appropriate participation of all students in the group. In general, instructor-assigned groups of mixed ability tend to perform better than student-selected groups.

To determine a priori how students might work together in a group, a background questionnaire can serve as a guide for rational group design. We suggest asking at least one of each of the following three types of questions:

1. Knowledge-based questions address students’ understanding of facts at various levels of complexity.
   - What is the enzyme used in PCR?
   - What argument could a defense attorney use to damage the credibility of DNA evidence?
   - Who wrote The Jungle?
   - How did the 1904 beef strike in Chicago and Upton Sinclair’s subsequent response affect U.S. governmental policy on meat standards?

2. Skills-based questions assess students’ ability to perform a task at varying proficiencies.
   For example, rate your comfort in performing the following task:
   Measure the $[H^+]$ of a solution using a pH meter.

   Not confident at all  Somewhat confident  Confident  Very confident
   (I’ll ask my mom)  (H$^+$ is acidic, right?)  (I did it in lab)  (I have a PhD)

3. Interest-based questions measure students’ values and attitudes towards the subject by rating them (often on a sliding scale).
   Are you interested in campaigning for stricter EPA vehicle emission standards?

   No.  Indifferent  Perhaps  Sign me up
   (I love smog)  (check out my SUV)  (I signed a petition)  (I was President of the Sierra Club)

   Some other common descriptors are:
   Easy - Difficult  Worry - Confident
   Strongly Agree-neutral-Strongly Disagree  Took class as requirement – Took it as Elective
   Enthusiastic - Disinterested

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Designing Questions to Assess Students Backgrounds

Think about the typical introductory course in your discipline. Imagine that you are trying to assess the preparation, ability, knowledge, and enthusiasm of students on the first day of this class.

1. What is one question that would assess their preparation to take the course?

2. What is one question that would investigate their motivations and/or enthusiasm for taking the course?

3. What is one question that would evaluate students’ preparation and willingness to work in small groups together?